

Learning Management Based on Information and Communication Technology in Improving Student Learning Outcomes

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ABSTRACT

Information and communication technology (ICT) is strongly tied to learning in the digital age, thus teachers and students must be able to use digital tools in all learning processes. It is evident that information technology significantly contributes to pupils' increased creativity in both large cities and rural towns. To fulfil all educational goals in general and school goals in particular, ICT application for increasing learning needs to be planned and evaluated according to the needs of students, teachers, and the school itself. According to the problem's issue, a literature review was used to collect data for this study. The study's findings indicate that planning is done to make the most of the ICT-based learning process. Planning starts by examining the requirements and circumstances of the school, including all of its strengths and weaknesses, and then evaluation is done to determine the ICT's dependability and strengths and weaknesses. For ICT to be used in the learning process, there must be a reliable internet connection. If there are issues with the learning process, the root reason may be quickly determined, and the primary solution is sought right away. According to the study's findings, ICT-based learning management can significantly enhance students' ability to learn to contemporary needs and the Merdeka curriculum.

KEYWORDS

Learning management; information and communication technology; improving learning outcomes

INTRODUCTION

Education will continue to change over time to keep up with trends. A nation's quality can be judged by the caliber of its educational system, which is one of its primary foundations (Purba et al., 2019; Syafrizal et al., 2022). Considering how crucial education is, education is a must for the advancement of the nation. Education also has a significant impact on how people develop, particularly in terms of character, insight, and professionalism. This is by Article 1 Paragraph 1 of Law No. 20 of 2003 concerning the National Education System, which states that "education has the goal of developing the potential that exists in students, be it knowledge, emotion, or skills." Students are expected to be valuable for the country and state by realizing this potential. If the quality of the learning process is in line with the learning objectives, potential pupils will develop well. If the learning process does not follow the learning objectives, the learning results will not be successful (Amin et al., 2021; Ingtyas, 2021). Given how crucial this is, we must enhance the educational process to raise the caliber of students and education in Indonesia.

The era of information and communication technology has arrived in the field of education today. One of the industries with the greatest influence on the adoption and

advancement of information and communication technology is education. The educational sector had to make use of information and communication technology, especially as the world entered the fourth industrial revolution (Purba et al., 2018; Amal et al., 2022). Information and communication technology (ICT) in educational institutions has supported higher learning over the past ten years. Technology-enhanced learning is used as a supportive educational tool to spread learner knowledge and abilities in elementary, secondary, vocational, and higher education institutions. Numerous studies on the effects of technology in education have found that learning with the support of technology has aided in the development of knowledge and skills. As students are empowered to pursue and embrace chances with confidence and potential thanks to their increased technological literacy, critical thinking has improved (Wu, 2021).

By expanding access to science and information technology within the context of delivering effective, quality, and fun education, information and communication technologies can enhance education. Information and communication technology-based learning can also encourage student involvement and interest in learning, boosting motivation and focus. Information and communication technology enabled distance learning (PJJ), often called distance learning, during the Covid-19 Pandemic. However, this only applies to institutions with reliable internet connections and those situated in cities. Additionally, it is the first time in history that the field of education, particularly in Pematang Siantar, has thoroughly experienced distance learning (PJJ) using ICTs like Google Meet, Zoom Meetings, Microsoft Teams, and others. Students, teachers, and even schools experience significant technological stuttering. Distance learning has excellent flexibility, which can reduce learning time and operational expenses for educational institutions. To help schools become more effective, learning management based on information and communication technology is simply necessary.

ICT Information and communication technology use have significant positive effects, but some drawbacks must be considered. This is especially true for students, who are particularly vulnerable to these drawbacks. Information and communication technology (ICT) in education can have some adverse effects, such as making students dependent on ICT and making them lazy to write, learn to count, and draw, allowing students to accidentally access sites that are useless if they are not accompanied by parents or teachers, and weakening students' social skills because they often prefer to connect via the internet or other forms of communication.

Schools must carefully prepare teacher training and learning support infrastructure related to information and communication technology to mitigate detrimental effects on learning when utilizing ICT. As a result, ICT-based education is varied and structured in an inventive, creative, and communicative manner. Additionally, the importance of ICT-based learning assessments is increasingly highlighted when using digital media to obtain the desired abilities. The learning process must be planned, put into practice, evaluated, and tracked to be effective and efficient. This suggests that management must carry out learning by the anticipated objectives. It is learning management that is under dispute.

LITERATURE REVIEW

Learning Management

The phrases management and learning combine to form the term learning management. The Latin term management is derived from the words *agere*, which means to do, and *human*, which means hand. The noun management is rendered as management or, in Indonesian, as manager, a verb meaning to manage in English. According to Husaini (2006), management is organizing, directing, and overseeing the efforts of organization

members and users of other resources to fulfil the organization's goals. To arrange, manage, and manage are all verbs derived from the term management (Saefullah, 2012). To create a better future, it can be concluded that management is a way for people to organize or manage and can help deal with time management issues and interpersonal relationships when they arise.

In contrast, learning is an activity that involves teachers and students in its implementation. In essence, learning is a process of interaction between pupils and their environment that aims to improve behaviour. According to Mulyasa (2004) and PS et al. (2002), learning is also seen as a teacher-organized process that teaches students how to acquire and process knowledge, skills, and attitudes. According to the management and learning concepts discussed above, learning management is the capacity of teachers (managers) to use available resources through activities to create and develop collaboration so that learning is made between them to achieve educational goals in the classroom effectively and efficiently. According to M. Yamin and Maisahm (2012) and Ingthias et al. 2022, learning management is the capacity to manage operationally and virtually the components associated with learning to provide additional value to these components.

According to experts, learning management is a critical component of the learning process. Education cannot function fully and optimally without effective management. The planning, organizing, implementing, and evaluating all learning activities, including the core curriculum and supplementary curriculum based on the standards established by the Ministry of Education and Culture or the Ministry of Religion, constitutes learning management. In its simplest form, learning management refers to controlling educational activity, including activities that are classed in the core curriculum or supporting curriculum based on the previously established curriculum by the Ministry of National Education or the Ministry of Religion. Teachers or educators serve as managers in learning management. The planning, organizing, managing (directing), and evaluation of learning are some management activities that educators are authorized and accountable to carry out.

Information and communication technology

Information and communication technology uses facilities, hardware, and software. With the introduction of communication satellites and glass fibre (fibre optics), which can send pulses at the speed of light, this information and communication technology has advanced quickly. Technology for information and communication is a systematic and practical procedure. This process includes a system that considers the variables that could affect activity procedures to make the process effective and efficient. This system incorporates ideas, concepts, and principles and facilitates solving everyday problems. The definition of this system demonstrates that everything will have an effect on, be influenced by, involve numerous interested parties (stakeholders), and be impacted by other objects in its surroundings. To accomplish the goal, it is vital to consider local, national, and worldwide environmental factors. Each student has the chance to access learning material provided interactively via computer networks thanks to the use of information and communication technology in the field of education, such as the usage of computers and computer networks (Munir, 2009).

A comprehensive definition of information and communication technology includes all processes for managing, processing, and transferring information across media (Asmani, 2011). Information and communication technology is a platform or tool for knowledge exchange between individuals (S. Arifianto, 2013). Technology connected to gathering, gathering, processing, storing, disseminating, and displaying information is called information and communication technology (ICT) (Rusman, 2011).

Due to several challenges, many schools in Indonesia still need to use information and communication technology to support learning. As frequently as not, schools need more suitable infrastructure, few technology specialists, a demanding curriculum load, several locations that threaten morale, and little encouragement for using information and communication technology. The institution faces numerous challenges that demand attention from different stakeholders. All aspects of education, including the teaching staff, the curriculum, the facilities, learning, management, and other associated elements, must also be adequately prepared for and improved.

RESEARCH METHODS

Data collection in this study used the literature review method by examining some research results and literature related to learning management and Information and Communication Technology. The method of literature review is data collection by looking for references related to topics originating from various books, journals, the internet, and so on based on research topics (Creswell, 2014). In addition, random observations were also made at several schools to see the use of information technology in learning and its impact on improving student learning through various activities at school. Because, in general, the development of this learning method will impact students, both positively and negatively.

RESULTS AND DISCUSSION

Information and communication technology (ICT)-based learning is using ICT to support the learning process to accomplish the predetermined goals. Information and communication technology-based learning is face-to-face instruction supported by ICT, enabling students to serve as instructors and material deliverers using digital content. Operationally, ICT-based learning is a learning activity supported by ICT infrastructure, using learning management tools and regulations, as well as digital content used as supplemental materials for in-person instruction in the classroom.

Information and communication technology-based learning go through multiple stages of development by school conditions, as shown below, rather than completely replacing the initial context of learning that occurs face-to-face in the classroom.

- a. Instruction is described as a face-to-face procedure in the classroom with digital content as a supplement in schools that have just pioneered instruction based on information and communication technologies.
- b. At a more advanced level, learning based on information and communication technology is defined as a face-to-face learning process in the classroom, with digital content serving as a complement.
- c. Learning that relies on information and communication technology is defined as a learning method that incorporates information and communication technology improvements. However, since information and communication technology is not used in the management of Learning, manual management of Learning still needs to be improved.
- d. Learning based on information and communication technology is best described as a learning method incorporated with ICT improvements. In this scenario, students engage in independent, online Learning that is not constrained by time or geography.

The implementation of the learning, which must consider the needs of the students, the expertise of the teacher, and the tools and facilities available, is where learning management differs from other learning processes in general. One image of the learning model is shown below.

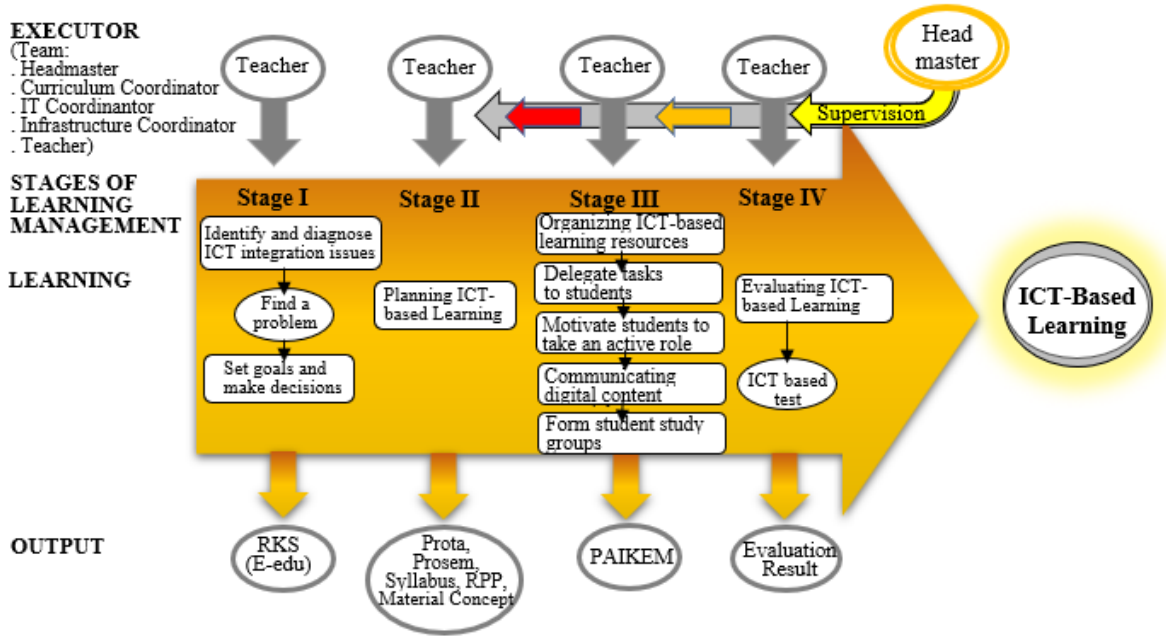


Figure 1. ICT-Based Learning Management Model (Maria & Sedyono, 2017)

The steps involved in management are the same as those involved in problem-solving because management is essentially a problem-solving process: (1) Problem identification; (2) Problem diagnosis; (3) Goal setting; (4) Decision making; (5) Planning; (6) Organizing; (7) Coordinating; (8) Delegating; (9) Initiating; (10) Communicating; (11) Working with Groups; and (12) Assessment (Supriadi & Gunawan, 2019). This learning model can be used to organize ICT-based learning phases by management functions, as demonstrated below.

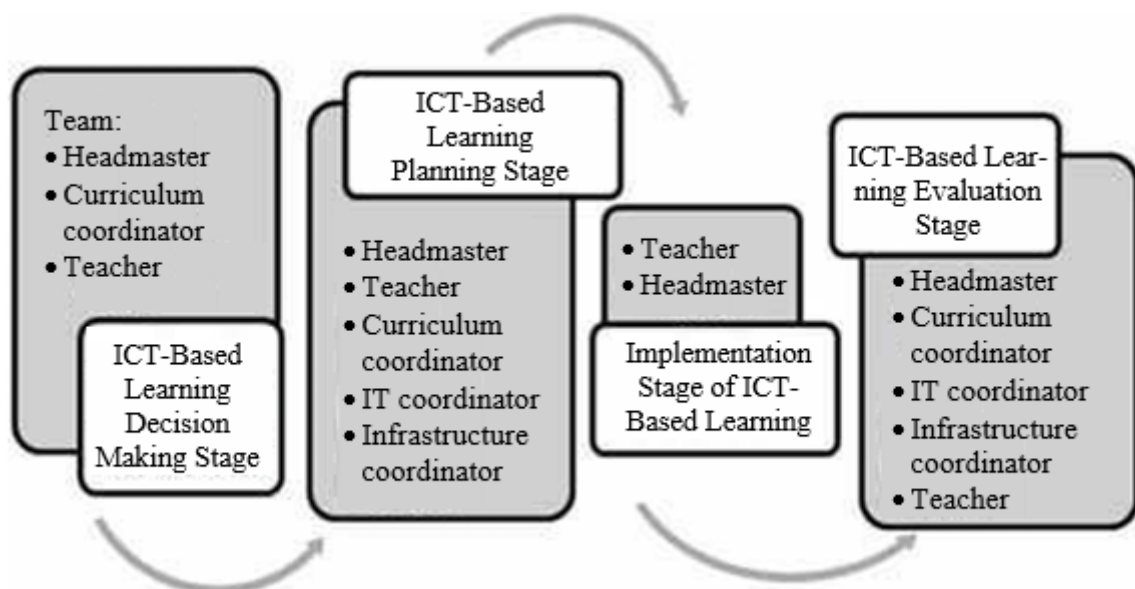


Figure 2. Stages and Implementation of ICT-Based Learning Management (Maria & Sedyono, 2017)

According to the illustration above, a teacher manages the teaching process in four different ways. 1. Planning, specifically establishing learning and teaching goals (teaching). Planning is accomplished by creating yearly plans, semester plans, section plans (for the subject matter), weekly plans, and daily plans (for lessons). A set of plans and arrangements for learning activities, learning media, time, classroom management, and learning assessment constitutes learning planning. The advantages of learning planning include facilitating the development of active, inventive, efficient, and enjoyable learning and creating learning preparations. 2. Planning entails linking or merging all teaching and learning resources to achieve objectives quickly and effectively, 3. They were leading, specifically inspiring students to be prepared to learn material 4. Monitoring entails determining whether the work or teaching and learning activities fulfil instructional goals. One way to do this is by teacher evaluation, which makes it possible to track the outcomes (Maria & Sedyono, 2017).

Given that many areas of Indonesia still lack reliable internet networks, the need for ICT adoption in teaching and learning institutions—which serve as centres of skills training—cannot be overstated. It must be incorporated into the educational curriculum to gauge technology's applicability across all industries and professions. Previous studies have suggested that learners' comprehension of how to use and develop with technology can be improved by applying fundamental digital literacy and skills. This can be done by updating curricula and having teachers refresh their knowledge and abilities. Other research results indicate that teachers are reluctant to use technology. The difficulty lies in creating a system that forces all instructors to receive training and use ICT (Moyo, 2019).

ICT-based learning can be used in various ways that can be tailored to the resources available in schools. Its implementation takes many different forms. There are various ICT-based learning formats, including Computer-Based Learning, where students interact directly with the computer on an individual basis, which gives them personalized learning experiences. In computer-based learning, students can interact directly with a computer system that has been purposefully created or used by the teacher as a tool for personalized learning. Because computer-based learning uses media learning patterns, that is its whole from start to finish utilizing computer system tools, student control of learning is entirely carried out by students (student-centred). Computer-based education does not just convert text from books or modules into interactive learning; material that reflects interactive education is chosen (Darmawan, 2012).

To make the content more accessible for pupils to understand, it must be coupled with various elements, including animation, video, simulations, demonstrations, etc. Computer-based learning has several benefits, including:

1. Making the learning process interactive and adaptable to children's learning styles,
2. Students learning more about the world than they would learn in a traditional classroom,
3. Not being constrained by time or space, and
4. Allowing children to express their creativity to the fullest.

A learning or learning activity known as "e-learning-based learning" uses media sites (websites) or electronic technologies that may be accessed through an internet network. E-learning is the use of electronic communication in training and education operations. Both traditional schooling and remote learning can use e-learning. E-learning, however, differs from traditional education. Describe a few of the following e-learning traits. a) Interactivity, or the availability of extra channels for direct or indirect communication, such as chat or messenger or forums, mailing lists, or guest books. b) Independence refers to the availability of flexibility in providing time, place, instructor, and teaching materials

to make learning more student-centred. c) Accessibility, or how simple it is to access educational materials distributed via an internet network with a broader audience than traditional learning environments. Information technology tools like video streaming and animation are made possible by enrichment, including educational activities, presentation materials, and training materials (Rusman, 2011; Natsir et al., 2022).

According to Asmani (2011) and Sutiah et al. (2002), multimedia-based learning is the integration of several media elements (print, cassette, audio, video, and sound) that are packaged and blended to transmit a specific topic or subject matter. Multimedia can therefore serve as a tool that aids in learning. Multimedia-based learning has several benefits, including the following: a) Information or teaching materials delivered through text can be remembered more effectively if pictures accompany them; b) Animation can be used to grab students' attention; and c) By the Quantum Learning theory, students have the modality to learn in a variety of ways. Because multimedia can represent each student's unique learning style, it is possible to overcome the diversity of modalities and learning styles by using media devices with multimedia systems (Rusman, 2011; Ampera et al., 2020). Corel Presentation, KPresenter, OpenOffice.Org Impress, and Microsoft Office Powerpoint are examples of presentation software that can produce multimedia-based instructional materials. There are also application applications for presentation processing that are now in use.

CONCLUSION

Making ICT a significant component of the learning process requires careful planning, organization, implementation, and evaluation to ensure that the learning outcomes are met. Additionally, it is essential to educate students about the potential for developing information and communication technology, which is ever-evolving, so that they will be inspired to assess and research it as a foundation for lifelong learning and will gradually advance. Communication and Information, The goal of information and communication technology is, in general, to broaden one's knowledge and horizons by understanding the tools used in information and communication technology, becoming familiar with the terms used in information and communication technology, and being aware of the benefits and drawbacks of these tools. Can effectively use tools for information and communication technologies. Make pupils aware of the possibilities for developing the rapidly evolving field of information and communication technology to inspire them to analyze and research it as a foundation for lifelong learning.

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